Institute for Science Technology and Public Policy

The Bush School of Government and Public Service

T E X A S   A & M   U N I V E R S I T Y

Use of Science in Gulf of Mexico Decision Making Involving Climate Change

US Environmental Protection Agency
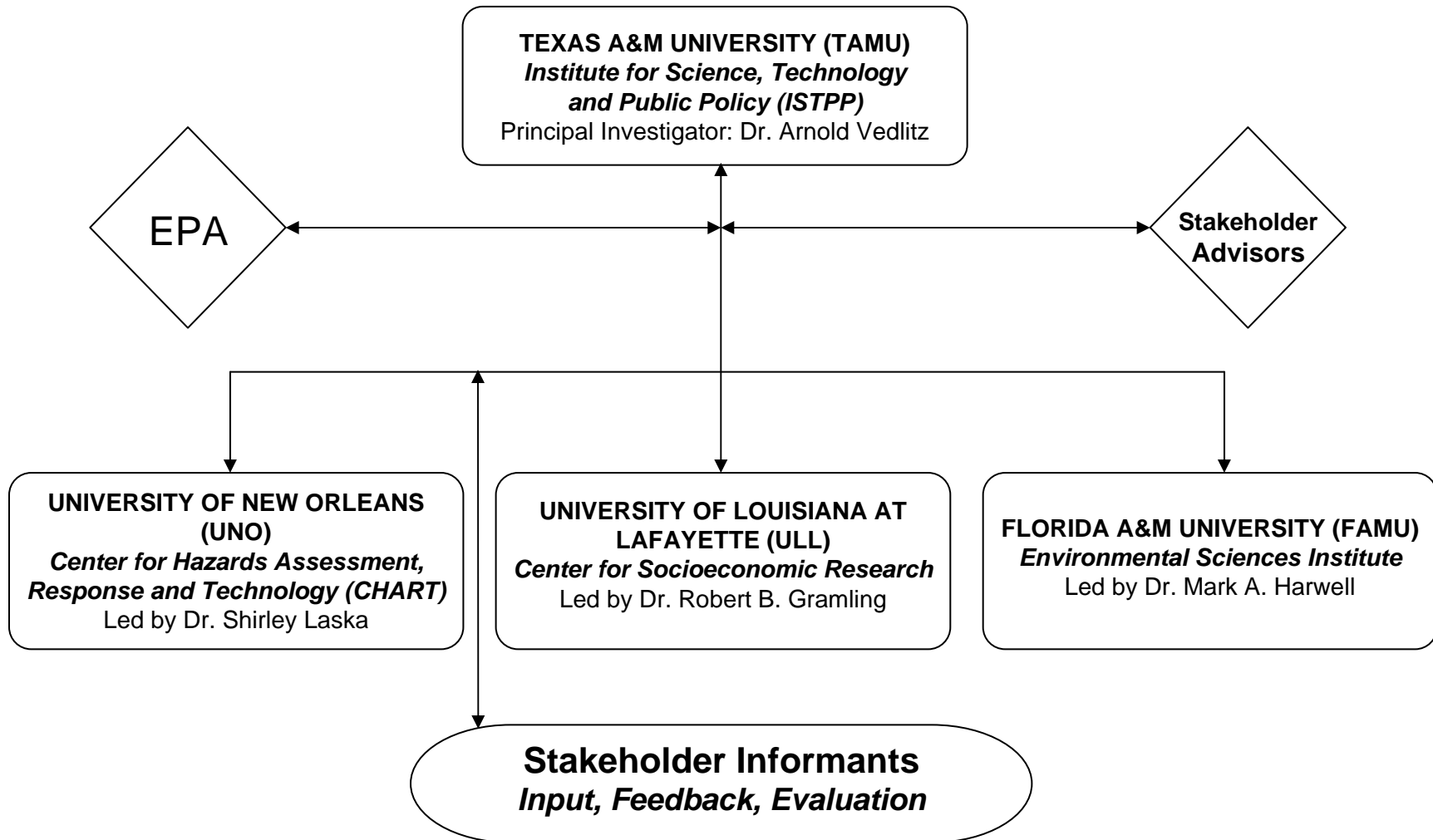*Cooperative Agreement*

EPA Project No. R-83023601-0
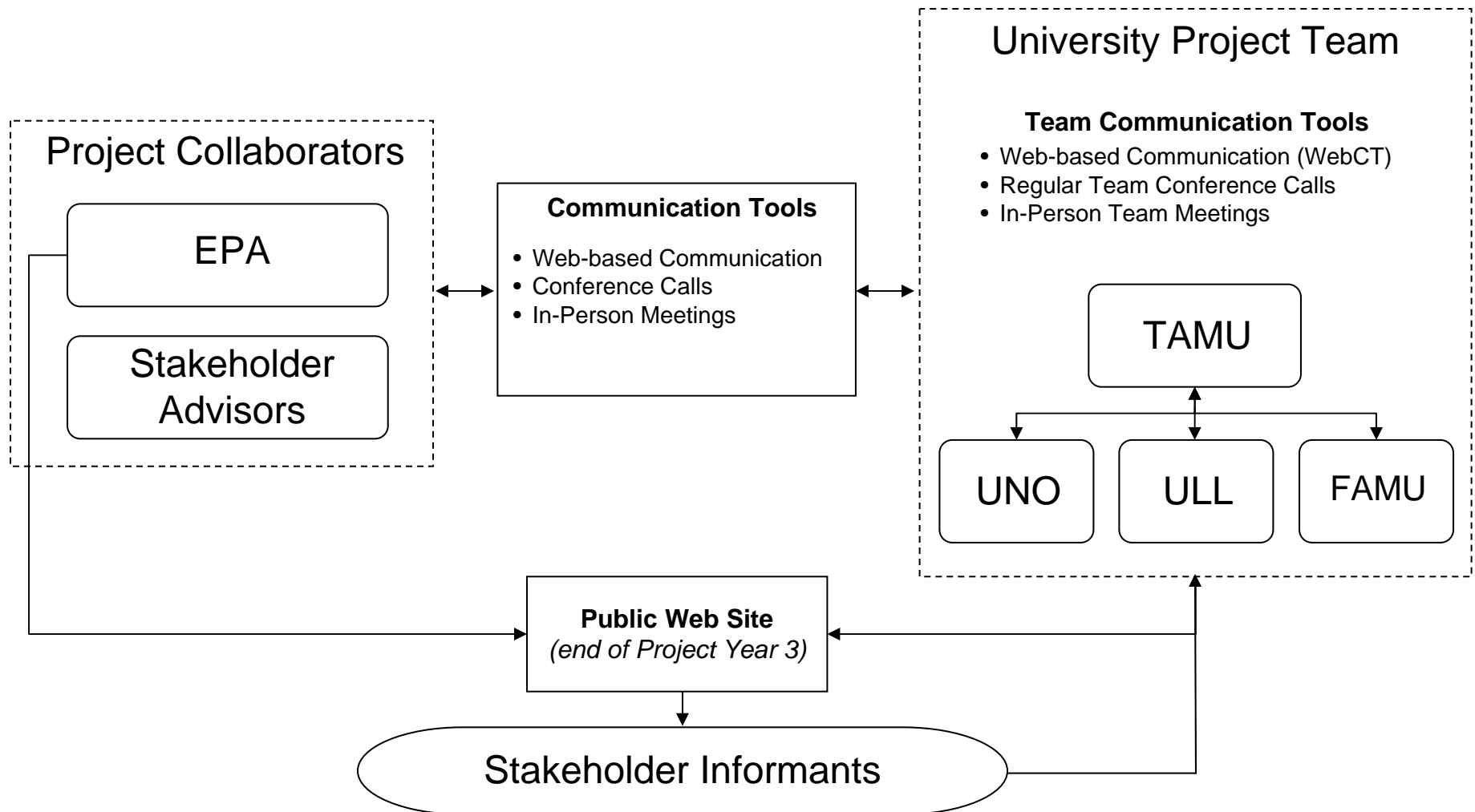
June 3, 2004

Research Team

- Texas A&M University – *Institute for Science, Technology and Public Policy, George Bush School of Government and Public Service*
  - Arnold Vedlitz, Ph.D., Principal Investigator
  - Letitia T. Alston, Ph.D.
  - B. Dan Wood, Ph.D.
  - Eric Lindquist, Ph.D.
  - Xinsheng Liu, Ph.D.
  - Meg Patterson Rogers
  - Nell Frazer Lindquist
  - Brenda Chaloupka

- EPA Project Manager
  - Susan Herrod-Julius

- University of New Orleans – *Center for Hazards Assessment, Response and Technology*
  - Shirley Laska, Ph.D., Co-Principal Investigator
  - Monica Teets Farris, Ph.D.
  - Ronald Hagelman, Ph.D.
  - Anthony Margavio, Ph.D.
  - Denise Reed, Ph.D.
  - Shea Penland, Ph.D.
  - Becky Boudreaux
  - Joselin Landry
  - Elise Chatelain
- University of Louisiana at Lafayette – *Center for Socioeconomic Research*
  - Robert Gramling, Ph.D., Co-Principal Investigator
  - Robert Twilley, Ph.D.
  - George Wooddell, Ph.D.
  - Carla Norris-Raynbird, A.B.D.
- Florida A&M University – *Environmental Sciences Institute*
  - Mark A. Harwell, Ph.D., Co-Principal Investigator
  - Helen Dreamal Ingram Worthen, Ph.D.
  - Theresa Goedeke, Ph.D.

Institute for Science
Technology and Public Policy
The Bush School of Government and Public Service
TEXAS A&M UNIVERSITY

June 3, 2004

Team Organizational Chart

TEXAS A&M UNIVERSITY (TAMU)
Institute for Science, Technology and Public Policy (ISTPP)
Principal Investigator: Dr. Arnold Vedlitz

EPA

Stakeholder Advisors

UNIVERSITY OF NEW ORLEANS (UNO)
Center for Hazards Assessment, Response and Technology (CHART)
Led by Dr. Shirley Laska

UNIVERSITY OF LOUISIANA AT LAFAYETTE (ULL)
Center for Socioeconomic Research
Led by Dr. Robert B. Gramling

FLORIDA A&M UNIVERSITY (FAMU)
Environmental Sciences Institute
Led by Dr. Mark A. Harwell

Stakeholder Informants
Input, Feedback, Evaluation

Institute for Science Technology and Public Policy
The Bush School of Government and Public Service
T E X A S   A & M   U N I V E R S I T Y

June 3, 2004

Team Communication Overview

Project Collaborators

- EPA
- Stakeholder Advisors

Communication Tools

- Web-based Communication
- Conference Calls
- In-Person Meetings

University Project Team

Team Communication Tools

- Web-based Communication (WebCT)
- Regular Team Conference Calls
- In-Person Team Meetings

- TAMU
- UNO
- ULL
- FAMU

Public Web Site
(end of Project Year 3)

Stakeholder Informants

Institute for Science Technology and Public Policy
The Bush School of Government and Public Service
T E X A S   A & M   U N I V E R S I T Y

June 3, 2004

Problem Definition

Decision makers and the public need to understand the uncertainties surrounding complex scientific information in order to make or influence informed policy decisions.
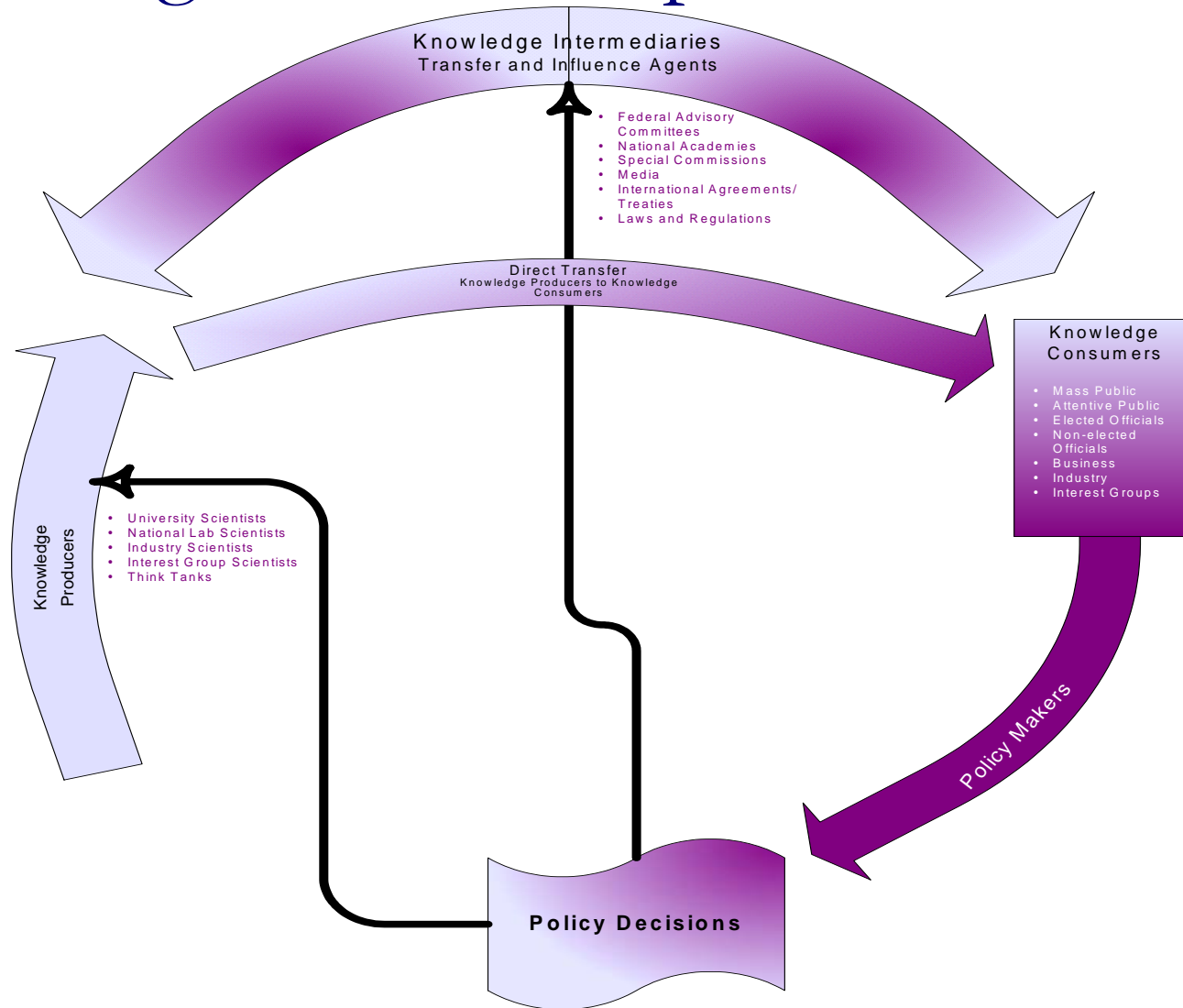
- ❑ Climate change will not be abstract global averages but real physical changes specific to each location.

- ❑ Global climate change will involve extreme events as well as gradual climate changes.

- ❑ Scientific estimates of global climate change events for specific locations reflect plausible ranges.

- ❑ Some scientific uncertainties make predictions and policy decisions on some topics difficult.

Institute for Science
Technology and Public Policy
The Bush School of Government and Public Service
T E X A S   A & M   U N I V E R S I T Y

June 3, 2004

Project Goals

- Investigate the salience of climate change for Gulf stakeholder groups

- Examine how stakeholder groups use climate change science information in decision-making

- Describe unfilled information needs on this topic

- Recommend strategies for making climate change information more useful to decision makers

Institute for Science
Technology and Public Policy
The Bush School of Government and Public Service
T E X A S   A & M   U N I V E R S I T Y

June 3, 2004

Knowledge Relationships and Interactions

Knowledge Intermediaries
Transfer and Influence Agents

- Federal Advisory Committees
- National Academies
- Special Commissions
- Media
- International Agreements/ Treaties
- Laws and Regulations

Direct Transfer
Knowledge Producers to Knowledge Consumers

Knowledge Consumers

- Mass Public
- Attentive Public
- Elected Officials
- Non-elected Officials
- Business
- Industry
- Interest Groups

Knowledge Producers

- University Scientists
- National Lab Scientists
- Industry Scientists
- Interest Group Scientists
- Think Tanks

Policy Makers

Policy Decisions

Institute for Science Technology and Public Policy
The Bush School of Government and Public Service
TEXAS A&M UNIVERSITY

June 3, 2004

Conceptual Framework

- **Social Construction of Problems**
  (Sociology)

- **Agenda Setting**
  (Political Science)

- **Social Amplification of Risk**
  (Cognitive Psychology, Communications, and Sociology)

Institute for Science
Technology and Public Policy
The Bush School of Government and Public Service
TEXAS A&M UNIVERSITY

June 3, 2004

Project Methodology

Data Sources

- Unstructured interviews

- Document analysis

- Observation of group processes

- Focus groups

Institute for Science
Technology and Public Policy
The Bush School of Government and Public Service
T E X A S   A & M   U N I V E R S I T Y

Project Overview

- Phase I
  - Research Team Implementation Workshop
  - Selection of research locations, endpoints and stressors
  - Stakeholder Workshop
- Phase II
  - Documentary evidence collection
  - Preliminary analyses of media coverage
  - Field work preparation
- **Phase III**
  - **Field work implementation**
  - **Continuing document collection**
- Phase IV
  - Analyses of project data
  - Project report

Institute for Science
Technology and Public Policy
The Bush School of Government and Public Service
TEXAS A&M UNIVERSITY

June 3, 2004

Project Status
as of June 1, 2004

Task	Timeline
Phase I--Research Team Workshop	
Phase I--Section of Locations, Endpoints and Stressors	
Phase I--Stakeholder Workshop	
Phase II--Documentary Evidence Collection	
Phase II--Preliminary Analyses	
Phase II--Field Work Preparation	
Phase III--Field Work Training	
Phase III--Conversations with Stakeholders	
Phase III--Observation of Groups	
Phase III--Focus Groups	
Phase IV--Analyses of Project Data	
Phase IV--Project Report	

Timeline axis: Sep-02, Mar-03, Sep-03, Mar-04, Sep-04, Mar-05, Sep-05, Mar-06

Legend:
- ■ Completed
- ☐ Remaining

June 3, 2004

Preliminary Summary Findings—
Newspaper Analysis

Media Coverage and Congressional Hearings on Climate Issues

Legend:
- Houston Chronicle 1991-2003 (left Y axis)
- Times Picayune 1991-2003 (left Y axis)
- Tampa Tribune 1994-2003 (left Y axis)
- New York Times 1970-2003 (left Y axis)
- Congressional Hearings 1970-2003 (right Y axis)

Left Y axis: Number of Newspaper Articles (0–500)
Right Y axis: Number of Congressional Hearings (0–50)
X axis: 1970–2005
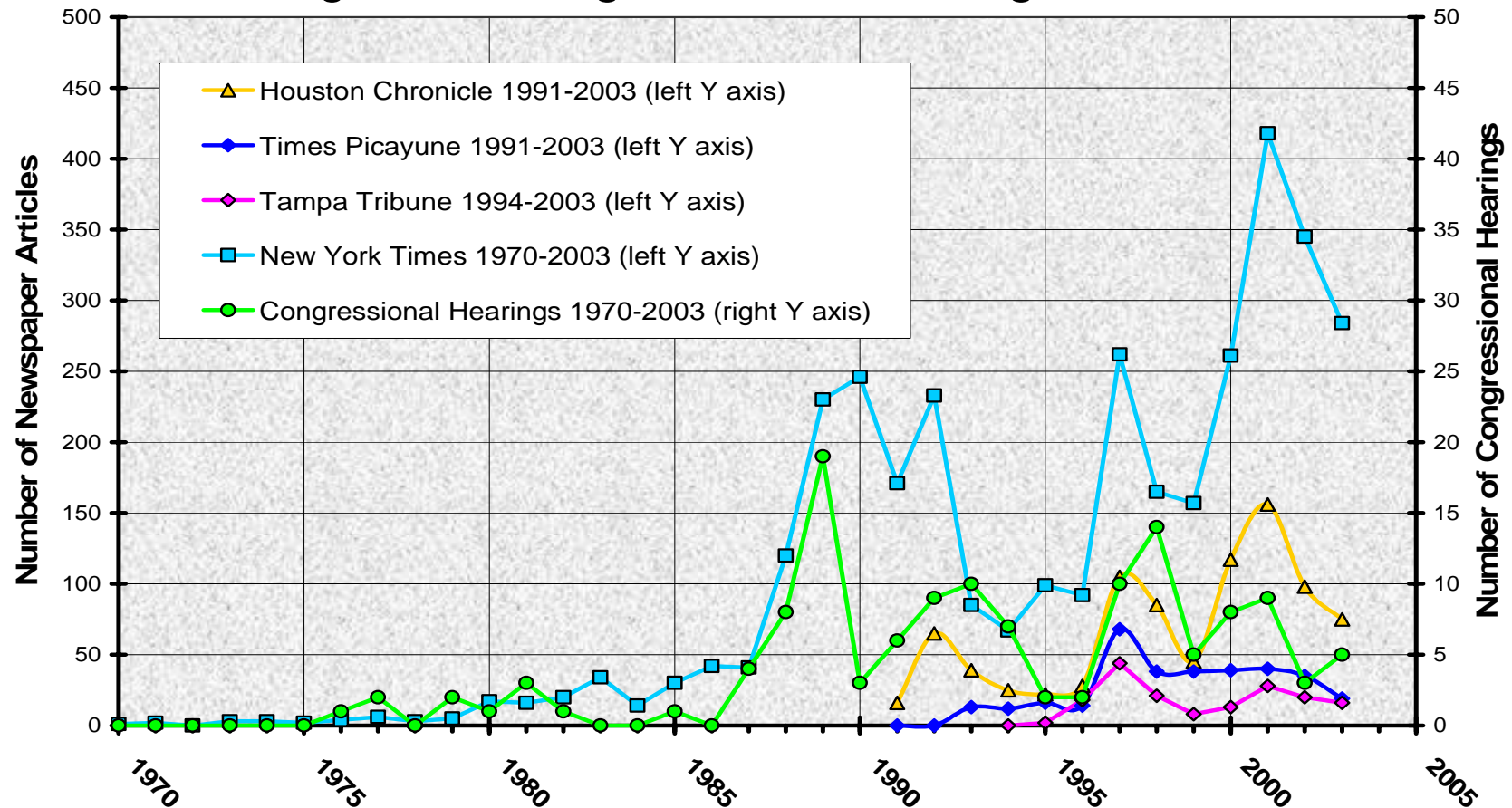
Preliminary Summary Findings—
Newspaper Analysis
Document Coding Form

EPA Research Project: Document Coding Form

ID Number: 1   Document Source: [▼]   Year: [ ]   Month: [ ]   Day: [ ]

Text Begins with: [ ]   Length: [ ]

☐ **Scope of Story**   ☐ Local_Regional   ☐ State   ☐ Multiple States   ☐ US National   ☐ Foreign National   ☐ International

US Government Actions? [▼]   **Scientific Stimulator?** [▼]

☐ **Issue Linkage**

☐ Agricultrue	☐ Environment	☐ Law, Crime, and Family Issues
☐ Banking, Fainance, Domestic Commerce	☐ Foreign Trade	☐ Macroeconomic Issues
☐ Civil Rights and Civil Liberties	☐ Government Operations	☐ Public Lands and Water Management Issues
☐ Defense	☐ Health	☐ Social Welfare Issues
☐ Culture and Entertainment	☐ International Affairs and Foreign Aid	☐ State and Local Government Administration
☐ Education	☐ Housing and Community Development	☐ Space, Science, Technology and Communications
☐ Energy	☐ Labor, Employment, and Immigration	☐ Transportation Issues

☐ **Endpoint**   ☐ Ecosystem   ☐ Infrastructure   ☐ Water Supply

Proposal/Solution Mentioned? [▼]

☐ **Focus of Proposal (Resource)?**   ☐ Technological   ☐ Economic   ☐ Ecological
☐ **Focus of Proposal (Approach)?**   ☐ Political Approach   ☐ Social Approach   ☐ Individual Approach
☐ **Focus of Proposal (Treatment)**   ☐ Mitigation   ☐ Adaptation

☐ **"Scientific Information" used?**

☐ Independent Source   ☐ Gov't Source   ☐ Environment Group Source   ☐ Industry Source   ☐ Other Scientific Sources

☐ **Different "Scientific" Views?**

Harmful Issue? [▼]   **Overall Tone Toward Natural Resources Based Industry?** [▼]

☐ **Gov't Actor?**   ☐ President   ☐ Congress   ☐ Courts   ☐ Federal Agency   ☐ State/Local

☐ **Candidates_Campaigns**

☐ **Interest Groups?**   ☐ Environmental   ☐ Industrial and Commercial   ☐ Professional/Scientific   ☐ Other groups

Record: |◄ ◄ [1] ► ►| ►* of 1

Institute for Science
Technology and Public Policy
The Bush School of Government and Public Service
TEXAS A&M UNIVERSITY

June 3, 2004

Preliminary Summary Findings—
Wave 1 Interviews

Problem Identification

- Population growth exacerbates many Gulf problems and increases demands on organizations' personnel and budgets.

- Similar problems may be defined differently by different organizations in terms of the causes, consequences and severity of the problem.

- Organizations tend to identify public problems within their specialized interests.

- Organizations with multiple interests tend to identify a broader range of problems than single-focused organizations.

- Linking environmental problems to economic considerations enhances the status of environmental issues on decision agendas.

- ***Climate change and climate variability DO NOT emerge as top of mind problems.***

June 3, 2004

Preliminary Summary Findings—
Wave 1 Interviews

How Gulf Coast Stakeholders Acquire and Use Scientific Information

- Search, acquisition and utilization of scientific information are heavily dependent on a pressing need for specific organization tasks.
- Search, acquisition and utilization of scientific information are selective to the responsibilities of the respective stakeholders rather than comprehensive or generic.
- Focused interests, limited time, trust and lack of resources contribute to the selective process of information search, acquisition and utilization.
- Complexity of and lack consensus on scientific information make information search, acquisition and utilization difficult.
- Stakeholders want states to establish and develop an easily accessible repository of scientific information focusing specifically on coastal community problems.

June 3, 2004

Preliminary Summary Findings—
Wave 1 Interviews

Links Between Scientists and Stakeholders

- Stakeholders do report reading and sharing information but the process is not systematic.

- Stakeholders value scientific information.

- Scientists are imbedded in stakeholder organizations; serving as members, on advisory boards and as consultants.

- For relatively simple information needs, organizations rely on information that is provided internally. The more uncertain and complicated the issue, the more likely they rely on external information providers.

- Sharing information among the different strata of government is a concern. Coordination and cooperation could be improved.

June 3, 2004

Preparation for Wave 2 Field Implementation

Panel Selection

Wave 2 Sample Selection

Storyline Development

June 3, 2004

Storyline Development—
Plausible Ranges for Texas

	Temperature (F) Warm-moist	Temperature (F) Hot-dry	Precipitation Warm-moist	Precipitation Hot-dry	Sea Level Rise
Texas 2020s	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Continued current trends (1.3 inches above present level)
Texas 2050s	+1 degree	+3 degrees	Minor increase. More frequent, more intense rainfall events	0 to -10% More frequent longer droughts	Most likely 8 inches, could be up to 1.5 feet
Texas 2100s	+3 degrees	+7 degrees	0 to +5% More frequent, more intense rainfall events	0 to -20% More frequent longer droughts	Up to 3 ft. above current trend, most likely 16 inches

June 3, 2004

Storyline Development—
Plausible Ranges for Louisiana

	Temperature (F) Warm-moist	Temperature (F) Hot-dry	Precipitation Warm-moist	Precipitation Hot-dry	Sea Level Rise
Louisiana 2020s	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Continued current trends
Louisiana 2050s	+1 degree	+3 degrees	0 to +5% More frequent, more intense rainfall events	0 to -5% More frequent longer droughts	Most likely 8 inches, could be up to 1.5 feet
Louisiana 2100s	+3 degrees	+7 degrees	0 to +10% More frequent, more intense rainfall events	0 to -10% More frequent longer droughts	Up to 3 ft. above current trend, most likely 16 inches

Storyline Development—
Plausible Ranges for Florida

	Temperature (F) Warm-moist	Temperature (F) Hot-dry	Precipitation Warm-moist	Precipitation Hot-dry	Sea Level Rise
Florida 2020s	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Increased frequency of extreme conditions	Continued current trends (1.3 inches above present level)
Florida 2050s	+1 degree	+3 degrees	0 to 5% More frequent, more intense rainfall events	0-10% More frequent longer droughts	Most likely 8 inches, could be up to 1.5 feet
Florida 2100s	+3 degrees	+7 degrees	0 to +10% More frequent, more intense rainfall events	0 to -20% More frequent longer droughts	Up to 3 ft. above current trend, most likely 16 inches

June 3, 2004

Information as a Decision Tool

The completed project will:

- Provide an explanation of how issues like climate change become identified as problems.

- Provide a description of how information relevant to climate change is received and processed.

- Identify information sources that are valued and trusted.

- Identify information types and formats that are most accessible— useable and understandable.

- Describe how information providers can best frame, package and deliver objective science and technological information for most effective consumption and utility by policy makers and the public.